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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,048	02/21/2002	Tadashi Kitamura	032887-007	9296

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EXAMINER

MAKI, STEVEN D

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,048

Applicant(s)

KITAMURA ET AL.

Examiner

Steven D. Maki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 1,2 and 5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 3,4 and 6-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 022702.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 022704.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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1) Although the certified copy of the priority document has not been received, a request to the Office of PCT Legal Administration for the WIPO stamped priority document is being made.

2) Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1 and 2, drawn to a sealant composition defined by specified ionic conductivity, water vapor permeability, heat deformation temperature, and storage modulus.

Group II, claim(s) 3 and 4, drawn to a sealant composition comprising a two component epoxy resin composition having a curing agent being tetrafunctional mercapto compound or modified polymercapto derivative and having an ionic conductivity of 0.6 mS/m or less.

Group III, claim(s) 5, drawn to a sealant composition comprising a one component epoxy resin composition having a curing agent being a micro encapsulated imidazole compound or a methyl methacrylate adduct of alicyclic diamine and having an ionic conductivity of 0.6 mS/m or less.

The inventions listed as Groups I, II and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Groups II and III do not have the special technical feature of specified ionic conductivity, water permeability, heat deformation temperature and storage modulus

Groups I and III do not have the special technical feature of two component epoxy resin composition having a curing agent being tetrafunctional mercapto compound or modified polymercapto derivative and having an ionic conductivity of 0.6 mS/m or less.

Groups I and II do not have the special technical feature of one component epoxy resin composition having a curing agent being a micro encapsulated imidazole compound or a methyl methacrylate adduct of alicyclic diamine and having an ionic conductivity of 0.6 mS/m or less.

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With respect to this restriction, "[u]nity of invention has to be considered in the first place only in relation to the independent claims in an international application and not the dependent claims" See MPEP 1850, page 1800-66, Rev. Feb. 2003, PCT rule 13.2 and 37 CFR 1.475.

In view of the presence of multiple dependent claims, the following comments are made: First: If applicant elects Group I, then claims 13 and 14 will also be examined. Second: If applicant elects Group II, then claims 6-14 will also be examined. Third: If Group III is elected, then claims 6-14 will also be examined.

3) During a telephone conversation with Robert Mukai on 2-27-04 a provisional election was made with traverse to prosecute the invention of Group II, claims 3, 4 and 6-14. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1, 2 and 5 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4) Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

5) Claims 7-14 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n).

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Although claims 7-14 are improper multiple dependent claims, claims 7-14 have been examined on the merits as if each of claims 7, 8, 9, 11 and 12 depend directly on claim 3.

6) The abstract of the disclosure is objected to because there are two different abstracts. Correction is required. See MPEP § 608.01(b).

7) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8) Claims 3, 4 and 6-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, it is unclear the claimed two-component epoxy resin composition excludes all ingredients other than (1) to (6) since in describing the two component epoxy resin, line 3 of claim 3 recites "consisting" (a closed transitional phrase) whereas line 9 recites "contains" (an open ended transitional phrase).

Claim 6 is indefinite because it can depend on claim 5, which has been withdrawn from consideration. In claim 6 line 2, it is suggested to change "any one of claims 3 to 5" to --any one of claims 3 and 4--.

9) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Kitamura

10) Claims 3-4 and 6-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura (US 6555187 or JP 2000-347203) in view of admitted prior art (specification pages 1 and 2), Japan '425 (JP 62-133425) and Takimoto et al (US 4882216).

US 6555187 filed 11-30-00 is available as prior art under 35 USC 102(e).
Japan 2000-347203 published 12-15-00 is available as prior art under 35 USC 102(a).
Applicant cannot rely upon the foreign priority papers to overcome this rejection
because a translation of said papers has not been made of record in accordance with
37 CFR 1.55. See MPEP § 201.15.

Kitamura discloses a sealant composition for a liquid crystal display comprising:
20-88.9% (preferably 30-70%) epoxy resin having 1.7-6 epoxy groups on average in a molecule wherein the epoxy resin has an ionic conductivity of 2 mS/m or less (30-70% falling within the claimed range of 15-84%);

5-30% curing agent (5-30% overlapping the claimed range of 10-50%);

0.1-10% curing accelerator (0.1-10% falling within the claimed range of .01-15%);

5-50% inorganic filler (5-50% being the same range as the claimed range of 5-50%);

0.1-5% silane coupling agent (0.1-5% being the same range as the claimed range of 0.1-5%);

1-15% rubber like polymer fine particles having a softening point of 0°C or lower and a primary particle diameter of 5µm ;

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0.1-9.5% high softening point polymer fine particles.

See US 6555187 at col. 3 lines 11-25, col. 7 lines 5-13, 26-33, col. 8 lines 11-24, col. 12 line 57-col. 13 line 51.

Kitamura does not appear to describe providing the epoxy containing sealant composition for liquid crystal displays as a two component epoxy resin composition. However, it would have been obvious to one of ordinary skill in the art to provide Kitamura's epoxy containing sealant composition as a two component epoxy resin composition since the admitted prior art suggests providing a sealant composition, which like that of Kitamura contains epoxy resin and curing agent, as a two component epoxy resin composition (i.e. a curing agent liquid containing a trifunctional mercapto compound and a base resin liquid containing polyethylene glycol diglycidyl ether). See specification page 2 lines 14-20. One of ordinary skill in the art would have been motivated to provide Kitamura's sealant composition as a two component composition since one of ordinary skill in the art would readily understand that a benefit of a two component composition is avoiding problems of storage stability caused by mixing the curing agent and base resin (i.e. by avoiding premature curing caused mixing of the curing agent and resin too far in advance of actual use thereof).

As to the particles, the claimed 1-25% rubbery fine particles reads on the Kitamura's 1-15% rubber like fine particles. Claim 3 fails to exclude additional particles of high softening point polymer fine particles. See recitation of "comprising" on line 2 of claim 3 and the recitation of "contains" on line 9 of claim 3. Also note that Kitamura teaches using particles of core/shell configuration instead of two separate groups of

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particles. See US 6555187 at col. 19 lines 51-64. In other words, the claimed "rubbery polymer fine particles" as set forth in part (6) of claim 3 read on core/ shell fine particles wherein the shell is formed from the rubber like polymer material and the core is formed from the high softening point polymer.

As can be seen from the above discussion, Kitamura substantially discloses the claimed invention except for the claimed curing agent.

As to claims 3 and 4, it would have been obvious to one of ordinary skill in the art to use a tetrafunctional mercapto compound (a thiol type curing agent) such as pentaerythritol tetrakis (3-mercaptopropionate) as the curing agent for the epoxy resin of Kitamura's sealant composition since (1) Japan '425 suggests using a polythiol curing agent for a epoxy resin containing sealant for a liquid crystal cell to improve flexibility, etc. (abstract) and (2) Takimoto et al specifically suggests using pentaerythritol tetrakis (3-mercaptopropionate) as a thiol type hardener (curing agent) for a flexible epoxy resin composition having good heat resistance and low hygroscopicity. Furthermore, it would have been obvious to purify the curing agent such that it has an ionic conductivity of 2 mS/m or less since Kitamura teaches using purification techniques such as ultrafiltration to reduce ionic conductivity to less than 2 mS/m so as to maintain long term display functionality.

As to the dependent claims: As to claim 6, the claimed properties would have been obvious in view of (1) Kitamura's teaching that the sealant composition should have properties such as low ionic conductivity and low moisture permeability and (2) the suggestion from Japan '425 and Takimoto to use a tetrafunctional mercapto compound

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as the curing agent for the epoxy. As to claim 7, Kitamura teaches a viscosity of 50-10000 Pas. See, for example, US 6555187 at col. 2 lines 60-64. As to claim 8, see Kitamura's discussion as to epoxy resin. See, for example, US 6555187 at col. 7 line 3 to col. 12 line 56. As to claims 9-12, see Kitamura's discussion on curing accelerators, rubbery fine particles, and inorganic filler. See, for example, US 6555187 at col. 20 line 63 to col. 21 to line 17, col. 12 line 57-col. 13 line 51, col. 17 line 10 to col. 18 line 7. As to claims 13 and 14 (process and LCD), see Kitamura's teaching to adhere the substrates with the sealant composition by hot pressing and then injecting the liquid crystal material to make a liquid crystal display. See, for example, US 6555187 at col. 25 lines 42-57.

Japan '743 (JP 11-246743)

11) Claims 3-4 and 6-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '743 (JP 11-246743) in view of the admitted prior art (admitted prior art (specification pages 1 and 2), Japan '425 (JP 62-133425), Takimoto et al (US 4882216) and Japan '721 (JP 61-127721).

Japan '743's publication date (9-14-99) is before the filing date (6-21-00) of applicant's foreign priority document. Japan '743 is available as prior art under 35 USC 102(a) and 35 USC 102(b).

Japan '743 discloses a sealant composition for producing a liquid crystal display panel comprising epoxy resin, curing agent, filler, coupling agent and rubber particles. Japan '743 does not appear to describe providing the epoxy containing sealant composition for liquid crystal displays as a two component epoxy resin composition.

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However, it would have been obvious to one of ordinary skill in the art to provide Japan '743's epoxy containing sealant composition as a two component epoxy resin composition since the admitted prior art suggests providing a sealant composition, which like that of Japan '743, contains epoxy resin and curing agent, as a two component epoxy resin composition (i.e. a curing agent liquid containing a trifunctional mercapto compound and a base resin liquid containing polyethylene glycol diglycidyl ether). See specification page 2 lines 14-20. One of ordinary skill in the art would have been motivated to provide Japan '743's sealant composition as a two component composition since one of ordinary skill in the art would readily understand that a benefit of a two component composition is avoiding problems of storage stability caused by mixing the curing agent and base resin by avoiding premature curing caused mixing of the curing agent and resin too far in advance of actual use thereof.

Japan '743 does not recite the claimed curing agent.

As to claims 3-4 and 6-14, it would have been obvious to one of ordinary skill in the art to use a tetrafunctional mercapto compound (a thiol type curing agent) such as pentaerythritol tetrakis (3-mercaptopropionate) as the curing agent for the epoxy resin of Japan '743's sealant composition since (1) Japan '425 suggests using a polythiol curing agent for a epoxy resin containing sealant for a liquid crystal cell to improve flexibility, etc. (abstract) and (2) Takimoto et al specifically suggests using pentaerythritol tetrakis (3-mercaptopropionate) as a thiol type hardener (curing agent) for a flexible epoxy resin composition having good heat resistance and low hygroscopicity. Furthermore, it would have been obvious to purify the epoxy resin and curing agent such that each has the

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claimed ionic conductivity of less than 2mS/m since (1) Japan '721 suggests purifying epoxy resin using an ultrafilter to remove impurities such as free ion so that the epoxy resin is suitable for an electronic device and optionally (2) it is taken as well known / conventional per se in the liquid crystal display art that ions in the liquid crystal material deteriorate the liquid crystal material. The remaining limitations in claim 3 (e.g. use of curing accelerator, amounts) would have been obvious and could have been determined without undue experimentation in view of (1) Japan '743's teaching to use inorganic filler, coupling agent and rubber particles in addition to the epoxy resin and curing agent in the sealant composition and (2) Japan '425 and Takimoto's suggestion to use curing accelerator with the curing agent; it being noted that silane coupling agent is taken as a well known coupling agent per se to be used in epoxy sealant / adhesive compositions.

As to the dependent claims: Claim 6 fails to define a sealant composition different from that suggested by the above applied prior art. As to claims 7, 13 and 14, it would have been obvious to provide Japan '743's sealant composition with the claimed viscosity and use it to make a LCD using the claimed steps in view of the admitted prior art (specification pages 1 and 2) and Japan '425s teaching to adhere the substrates with the sealant composition using heat and then to inject liquid crystal material to form a LCD. As to claims 8-12, it would have been obvious to use the claimed epoxy resin, accelerator, rubber particles and inorganic filler in view of (1) Japan '743's teaching to use rubber particles and inorganic filler in addition to the epoxy resin and curing agent in the sealant composition and (2) Japan '425 and

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Takimoto's suggestion to use curing accelerator with the curing agent; it being noted that (a) at least Takimoto teaches using a mixture of epoxy resins, (b) the specified accelerator is taken as being a well known / conventional accelerator per se for epoxy resin, and (c) inorganic filler being a graft product with silane coupling agent is taken as a well known / conventional inorganic filler per se in the epoxy art.

Remarks

12) Von Gutflod (US 6219126) is cited of interest for disclosing use of a two component epoxy for fabricating a liquid crystal display panel.

Tahara et al (US 5665797) and Japan is cited of interest for disclosing a sealant composition comprising epoxy and rubber particles.

Johnson et al (US 4879414) is cited of interest for teaching curing epoxy resin with polythiol to obtain better heat resistance and greater resistance to absorption of water. See abstract.

Abbey et al (US 6153719) is cited of interest for its disclosure of well known thiol curing agents for epoxy compounds at col. 4 lines 27-col. 5 line 8.

The remaining references are of interest.

13) No claim is allowed.

14) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven D. Maki
March 20, 2004


STEVEN D. MAKI 3-20-04
PRIMARY EXAMINER
~~GROUP 1300~~
Av 1733